Remarks

In view of the following remarks, Applicants request reconsideration of the present application. No claims have been amended.

The Examiner has rejected Claims 1-5, 7-22, 31, 32, 34-42, 44, 46, 64-67, 69-84, 93-95 and 97-112 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,985,356 by Schultz et al.

Applicants respectfully traverse these rejections. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Applicants submit that the Examiner has not met the burden required under 35 U.S.C. §102.

Schultz et al. is directed to a method and apparatus for the preparation and use of a substrate having an array of diverse materials in predefined regions on the substrate. The substrate is prepared by delivering components (i.e., reactants) of materials to predefined regions on the substrate and simultaneously reacting the components to form at least two materials. See, e.g., the Abstract. For example, an array of materials having different chemical compositions is formed by delivering the different reactants to pre-defined regions on the substrate in a step-wise fashion. Multiple deposition steps and masking techniques are used to vary the concentration of a particular reactant that is deposited on a given region of the substrate. A small, precisely metered amount of each reactant component is delivered into each reaction region. (Col. 10, lines 37-39). By varying the amount of the individual reactants that is deposited from one region to another region, different materials can be formed on the substrate. The Examiner states that Schultz et al. "discloses a process which includes *depositing a plurality of reacted materials* upon specific regions of a substrate..." (emphasis added). However, Schultz et al. deposits reactants, not reacted materials, onto a substrate. The array of reactants can then be reacted using a number of different synthetic routes. (Col. 24, lines 55-57).

The methods of the present invention are directed to changing the precursor and/or reactor conditions continuously during particle fabrication, such that particles of different composition and/or material property can be fabricated in one step, as opposed to the multiple steps required by Schultz et al. to form different material compositions deposited on a substrate.

Independent Claim 1 recites a method for the fabrication of *particulate* materials including *continuously* providing a precursor composition to a reactor and *continuously* reacting the precursor composition to form reacted precursor particles and collecting the reacted precursor particles, wherein the precursor composition is varied in a controlled manner and on a *real-time basis* and the precursor particles can be separately identified and tested for a material property.

Schultz et al. do not disclose or suggest the fabrication of particulate materials. The Examiner points to Col. 20, lines 19-22 of Schultz et al. as disclosing the preparation of a dry powder. However, this passage in Schultz et al. refers to delivery of a reactant component, not the final material. The material in the process of Schultz et al. is formed by depositing the reactants onto a region of a substrate and reacting them on the substrate. The reactants are typically deposited as thin-films or as solutions (Col. 25, lines 35-39), which are then reacted on the substrate. Such methods are not adapted to the formation of particulate materials, as is required by independent Claim 1.

In addition, Schultz et al. do not disclose or suggest continuously providing a precursor composition to reactor and continuously reacting a precursor composition in the reactor. According to Schultz et al., precursors are sequentially deposited onto a substrate and are then reacted to form the material. The deposition of the reactants requires a number of discrete multiple steps and possibly masking to vary the concentration of the reactants in a particular region of the substrate. The reactants of Schultz et al. are not continuously provided to a reactor, nor is the precursor composition continuously reacted in a reactor.

Further, Schultz et al. do not disclose or suggest varying the precursor composition on a *real-time basis* as is required by Claim 1. As stated at page 6, lines 13-15 of the present specification, real-time basis means that the variable is changed without any

substantial interruptions in the operation of the reactor system. Schultz et al. disclose that different materials can be formed by depositing reactants at different locations on a substrate and then reacting the reactants on the substrate. The reactants are deposited sequentially, requiring discrete multiple steps to form different material compositions and possibly intermediate masking steps.

In view of the foregoing, it is respectfully submitted that Claim 1 is not anticipated by Schultz et al. Claims 1-5 and 7-22 depend upon Claim 1 and include all the limitations thereof. These claims also further define the invention over Schultz et al. For example, dependent Claim 8 recites the method of Claim 1 where the precursor composition is a flowable liquid and the step of providing the precursor composition to the reactor includes dispersing the precursor composition to form dispersed droplets. Such a method is not disclosed or suggested by Schultz et al. Dependent Claims 10-12 recited different types of reactors, none of which would be particularly useful in the method disclosed by Schultz et al.

Independent Claim 31 recites a process for the fabrication and analysis of particulate materials, including the steps of providing a precursor composition and continuously reacting the precursor composition in a reactor to form reacted particles, wherein a reactor condition is varied in a controlled manner to form at least two portions of the reacted precursor particles. The portions of reacted precursor particles are then analyzed for at least one material property.

As is discussed above, Schultz et al. do not disclose or suggest fabrication and analysis of particulate materials. Further, Schultz et al. do not disclose or suggest *continuously* reacting a precursor composition and varying a reactor condition in a controlled manner and on a real time basis to form different reacted precursor particles.

In view of the foregoing, Applicants respectfully submit that Claim 31 is not anticipated by Schultz et al. Claims 32 and 34-42 depend upon Claim 31 and include all of the limitations thereof.

Independent Claim 44 recites a method for selecting a particulate material having a desired property, including the steps of reacting *dispersed* precursor droplets in a reactor to form reacted precursor particles and measuring at least one material property of the

particles while dispersed in a carrier gas.

Schultz et al. do not disclose a method for the fabrication and analysis of a particulate material. Further, Schultz et al. does not disclose or suggest continuously providing a precursor composition to a reactor in the form of precursor droplets. Schultz et al. merely disclose that reactant solutions can be deposited sequentially onto a substrate. Only then is the substrate provided to a reactor or otherwise reacted to form the material. Claim 44 also recites the step measuring at least one material property of the precursor particles while they are dispersed in the carrier gas. Clearly, Schultz et al. does not disclose or suggest dispersing reactive precursor particles in a carrier gas and measuring in that state.

In view of the foregoing, Applicants respectfully submit that Claim 44 is not anticipated by Schultz et al. Claim 46 depends upon Claim 44 and include all of the limitations thereof.

Independent Claim 64 recites a method for the fabrication of a plurality of particulate materials by continuously providing a precursor composition to a reactor, continuously reacting the precursor composition in the reactor under at least one reactor condition to form reacted precursor particles and collecting the reacted precursor particles. The precursor composition is varied in a controlled manner and on a real-time basis such that the reacted precursor particles include a first reacted precursor portion at a first time and a second reacted precursor portion at a second time and at least one material property of the first reacted precursor portion is different than the one material property of the second reacted precursor portion, and where the precursor composition is varied on a real time basis and the first reacted precursor portion has a different chemical composition than the second reacted precursor portion.

As is discussed above, Schultz et al. does not disclose or suggest a method for the fabrication of particulate materials. Further, Schultz et al. do not disclose or suggest *continuously* providing a precursor composition to a reactor and *continuously* reacting a precursor composition in the reactor. Also, Schultz et al. do not disclose or suggest varying

the precursor composition *on a real-time basis*. Rather, the different materials are formed by sequential deposition and/or masking steps.

For the foregoing reasons, it is respectfully submitted that Claim 64 is not anticipated by Schultz et al. Claims 65-67 and 69-84 depend upon Claim 64 and include all of the limitations thereof.

Independent Claim 93 recites a method for the fabrication of a plurality of particulate materials, including the steps of continuously providing a precursor composition having at least a first precursor component and a second precursor component to a reactor, continuously reacting the precursor composition in the reactor under at least one reactor condition to form reacted precursor particles, and collecting the reacted precursor particles, wherein the concentration of at least one of the first and second precursor components in the precursor composition is varied in a controlled manner and on a real-time basis such that the reacted precursor particles include a first reacted precursor portion at a first time and a second reacted precursor portion at a second time and at least one material property of the first reacted precursor portion is different than the one material property of the second reacted precursor portion.

As is discussed above, Schultz et al. does not disclose or suggest fabricating particulate materials, nor does Schultz et al. disclose or suggest continuously providing a precursor composition to a reactor and continuously reacting the precursor composition in the reactor to form reactor precursor particles. Therefore, it is respectfully submitted that independent Claim 93 is not anticipated by Schultz et al. Claims 94, 95 and 97-112 depend upon Claim 93 and include all of the limitations thereof.

The Examiner has also rejected Claims 6, 23-30, 33, 43, 45, 47-63, 68, 85-92, 96 and 113-120 under 35 U.S.C. §103(a) as being unpatentable over Schultz et al. Applicants respectfully traverse these rejections.

Claims 6 and 23-30 depend upon Claim 1, discussed above. Claims 33 and 43 depend upon Claim 31, discussed above. Claims 45 and 47 depend upon Claim 44, discussed above.

Independent Claim 48 recites a method for the continuous fabrication of a plurality of

particulate electrocatalyst compositions by providing a precursor to the electrocatalyst having at least first and second precursor components, reacting the precursor to form a particulate reacted precursor and collecting the particulate reacted precursor, where the precursor composition is controllably changed during the fabrication method.

As is discussed above, Schultz et al. does not disclose or suggest the fabrication of a plurality of particulate materials, particularly such as particulate electrocatalyst compositions. Further, the precursor composition of Schultz et al. (reactants) is not changed during the fabrication method - in Schultz et al. the same precursor composition is deposited numerous times to attain a material having a different composition.

In view of the foregoing, it is respectfully submitted that Claim 48 is not obvious in view of Schultz et al. Claims 49-60 depend upon Claim 48 and include all of the limitations thereof.

Independent Claim 61 recites a method for the continuous fabrication of a plurality of pharmaceutical powders. The method includes the steps of providing a precursor to a pharmaceutical composition including first and second precursor components, generating precursor droplets from the precursor and reacting the precursor to form pharmaceutical particles, wherein the pharmaceutical composition is controllably changed during the fabrication method.

Schultz et al. do not disclose or suggest fabricating pharmaceutical *powders*. Further, Schultz et al. do not disclose or suggest changing the composition of a pharmaceutical *during* the fabrication method.

In view of the foregoing, it is respectfully submitted that Claim 61 is not obvious in view of Schultz et al. Claims 62 and 63 depend upon Claim 61 and include all of the limitations thereof.

Claims 68 and 85-92 depend upon Claim 61, discussed above. Claims 96 and 113-120 depend upon Claim 93, discussed above.

The Examiner has also provisionally rejected Claims 1-5, 13-15, 18-21, 24-27, 31, 40-43, 64-67, 75-77, 80-83, 86-89, 93-95, 103-105, 108-111 and 114-117 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over

Claims 1-39 of U.S. Patent Application Serial No. 09/821,848. If and when appropriate, Applicants will submit a Terminal Disclaimer.

Applicants hereby request a three-month extension of time for responding to the outstanding Examiner's Action and enclose a check for the appropriate fee. It is not believed that any additional fees are owed, however, any such additional fees can be charged to deposit account 50-1419.

Respectfully submitted,

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